

Foundations:
Institutions and Cooperation

Prisoner's Dilemma:

- ▶ Two criminals rob a bank and hide the money.
- ▶ Both are caught by police but there is not enough evidence to convict them.
- ▶ Offered the same deal: rat the other guy out and go free (get the money) or stay quiet and get a light sentence.
- ▶ Collectively they do best by staying quiet.
- ▶ Yet each has an incentive to rat out his accomplice.

The Prisoner's Dilemma

Represent this as a 2x2 game.



Key concepts

- ▶ Players
- ▶ Strategies
- ▶ Outcomes
- ▶ Utilities

Players choose strategies which lead to outcomes that give players utility.

Figure: A Prisoner's Dilemma

		Partner	
		<i>C</i>	<i>D</i>
You	<i>C</i>	(3, 3)	(1, 4)
	<i>D</i>	(4, 1)	(2, 2)

 Nash Equilibrium  Pareto Efficient

Properties of game outcomes

Nash equilibrium: Outcome where neither player has a positive incentive to change their strategy.

Pareto efficient: Outcome where any change would make at least one player worse off.

- ▶ Desirable normative properties.
- ▶ No “goodies” left on the table.

Equilibria DO NOT have to be Pareto efficient.

Figure: Finding Nash Equilibrium in the Prisoner's Dilemma

		Partner	
		<i>C</i>	<i>D</i>
You	<i>C</i>	(3, 3)	(1, 4)
	<i>D</i>	(4, 1)	(2, 2)



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■ Nash Equilibrium ▨ Pareto Efficient

The Prisoner's Dilemma in IR

Individual incentive to defect undermines the collective interest to cooperate.

Security Dilemma

- ▶ An example: during the Cold War, the best strategy for both the US and Soviet Union was to defect and keep building weapons because could not be sure the other was not.
- ▶ Paradoxically less secure after building more weapons.
... and less wealthy.

The Prisoner's Dilemma in IR

Other examples

- ▶ Mitigating climate change
- ▶ Preventing maritime piracy
- ▶ Basic scientific research
- ▶ Others?

Other canonical 2x2 games

	<i>C</i>	<i>D</i>
<i>C</i>	(3,3)	(2,4)
<i>D</i>	(4,2)	(1,1)

Chicken

	<i>C</i>	<i>D</i>
<i>C</i>	(4,4)	(1,3)
<i>D</i>	(3,1)	(2,2)

Stag Hunt

Examples in IR

Chicken

- ▶ Cuban missile crisis

Stag-Hunt/Coordination

- ▶ Scientific standard/measurements

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Chicken

- ▶ Cuban missile crisis

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Other examples?

Collective Action Problems

- ▶ *Public goods* are socially desirable products defined by two qualities:
 - ▶ *Nonexcludable*
 - ▶ *Nonrival* in consumption
- ▶ Efforts to produce goods are hindered by **collective action problems**.
 - ▶ Each actor aims to benefit from the good without bearing the costs for it
- ▶ Each individual has an incentive to **free ride**:
 - ▶ Failing to contribute while benefiting from the efforts of others

Criticism/Concern about Game Theory

Are there limitations to the application of these “games” to international relations?

- ▶ They aren't realistic
- ▶ Does everyone have to think that everyone else is playing the same game?
- ▶ What if your opponent is “irrational,” and cares more about making sure you get few points? (e.g., suicide terrorism)

Cooperation and Institutions

Factors that facilitate cooperation:

- ▶ A hegemon
- ▶ Institutions
 - ▶ focal points
 - ▶ repeated interactions
 - ▶ monitoring
 - ▶ enforcement
 - ▶ lengthen time horizons

If both sides can commit to playing the prisoners' dilemma indefinitely, then cooperative equilibria are available.

Conclusion

Many situations in international relations look like Prisoner's Dilemma.

- ▶ an important example is the security dilemma

One solution is to change the incentives. But this is infeasible in many settings (and assumes away the problem).

Institutions can help states cooperate by providing monitoring, enforcement, repeated interactions, and long time horizons.

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